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09/737,658	12/15/2000	Tomoo Murakami	NECU 18.117	2267

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EXAMINER

GRAYBILL, DAVID E

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 01/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/737,658

Applicant(s)

MURAKAMI, TOMOO

Examiner

David E Graybill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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The drawings are objected to under 37 CFR 1.83(a).

The drawings must show every feature of the invention specified in the claims. Therefore, the features of claim 13, specifically, the limitation, "the trapezoidal contour including a lower edge on an outer side of the mounting section and an upper edge on a central side of the mounting section, the upper edge being longer than the lower edge," must be shown or the features canceled from the claim.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Applicant is advised that should claims 2 and/or 3 be found allowable, one of claims 2 and 3 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

In claims 7, 8, 11, 12, 15, 16, 19 and 20 the scope of the terms "instantaneous thermosetting resin," and "a contraction ratio and an expansion ratio of cured resin" is unclear because there is no art recognized definition of the terms, and the terms are not otherwise explicitly defined in the disclosure.

In claim 17, the scope of the limitation "a shorter edge" cannot be determined because the thing being compared to the comparative term "shorter" is not recited and cannot otherwise be determined.

Claims 7, 8, 11, 12, 15, 16, 19 and 20 have not been rejected over the prior art because, in light of the 35 U.S.C. 112 rejections supra, there is a great deal of confusion and uncertainty as to the proper interpretation of the limitations

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of the claims; hence, it would not be proper to reject the claims on the basis of prior art. As stated in *In re Steele*, 305 F.2d 859, 134 USPQ 292 (CCPA 1962), a rejection should not be based on considerable speculation about the meaning of terms employed in a claim or assumptions that must be made as to the scope of the claims. See also MPEP 2173.06.

In the rejections *infra*, reference labels are generally recited only for the first recitation of identical claim language.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Tokuno (5763295).

At column 3, line 11 to column 4, line 59; and column 5, line 46 to column 6, line 19, Tokuno teaches the following:

1. A semiconductor device characterized in that; having a plural of solder resist 103 between a pair of mounting pad 102 line setup nearly parallel to said mounting pad line each other; said solder resist constructing up to a corner portion of said

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mounting pad lines so as to spread a sealing resin 107
uniformity when said semiconductor device 105 is set on said
mounting pad.

2. A semiconductor device characterized in that; having a plural
of solder resist between a pair of mounting pad line set up
nearly parallel to said mounting pad line each other; said
solder resist divided and constructed up to a corner portion of
said mounting pad lines so as to feed a sealing resin spreading
uniformity when said semiconductor device is set on said
mounting pad.

3. A semiconductor device characterized in that; having a plural
of solder resist between a pair of mounting pad line set up
nearly parallel to said mounting pad lines each other; said
solder resist divided and constructed up to a corner portion of
said mounting pad lines so as to feed a sealing resin spreading
uniformity when said semiconductor device is set on said
mounting pad.

4. A semiconductor device characterized in that; having a plural
of solder resist 303 between two pairs of mounting pad 302 line
set up nearly parallel to said mounting pad lines each other;
said solder resist divided diagonal direction formed by said two
pairs of mounting pad line up to a corner portion of said
mounting pad line so as to feed a sealing resin 307 spreading

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uniformity when said semiconductor device 305 is set on said mounting pad.

Claims 5, 6, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsukagoshi (5804882).

5. A semiconductor device mounting method in which on a substrate on which a mounting pad including a mounting section is formed, sealing resin is supplied by one-point coating onto a central position of the mounting section, a semiconductor device including a plurality of projected electrodes is placed on the substrate, and the resin is heated under a predetermined pressure to thereby mount the semiconductor device onto the substrate, comprising the steps of: arranging in the mounting section a plurality of solder resist zones 6 to orient a flow of the sealing resin in a predetermined direction, the zones projecting upward; mounting the semiconductor device 1 on the mounting section and supplying thereby the sealing resin 11 in a circumferential area of the semiconductor device mounted on the substrate; and forming with the sealing resin a filet in the circumferential area, the filet being uniform in quantity of resin.

6. The semiconductor device mounting method in accordance with claim 5, wherein the solder resist zones has a thickness ranging from 10 μm to 30 μm .

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9. A semiconductor device mounting method in which on a substrate on which a mounting pad including a mounting section is formed, sealing resin is supplied by one-point coating onto a central position of the mounting section, a semiconductor device including a plurality of projected electrodes is placed on the substrate, and the resin is heated under a predetermined pressure to thereby mount the semiconductor device onto the substrate, comprising the steps of arranging in the mounting section a plurality of solder resist zones to orient a flow of the sealing resin in a predetermined direction, the zones projecting upward; mounting the semiconductor device on the mounting section and supplying thereby the sealing resin in a circumferential area of the semiconductor device mounted on the substrate; forming with the sealing resin a filet in the circumferential area, the filet being uniform in quantity of resin; and further comprising the step of arranging, on an inner side of the mounting pad on the substrate, the solder resist zones each of which has a rectangular contour, the solder resist zones being respectively parallel to edges of the semiconductor device mounted on the substrate.

10. The semiconductor device mounting method in accordance with claim 9, wherein the solder resist zones has a thickness ranging from 10 μm to 30 μm .

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 13, 14, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Greenwood (5647123) and Tsukagoshi (5804882).

At column 3, line 4 to column 5, line 24, Greenwood teaches the following:

13. A semiconductor device mounting method in which on a substrate on which a mounting pad including a mounting section is formed, sealing resin is supplied by one-point coating onto a central position of the mounting section, a semiconductor device including a plurality of projected electrodes is placed on the substrate, and the resin is heated under a predetermined pressure to thereby mount the semiconductor device onto the substrate, comprising the steps of: arranging in the mounting section a plurality of solder resist zones 314 to orient a flow of the sealing resin 504 in a predetermined direction, the zones projecting upward; mounting the semiconductor device 202 on the

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mounting section and supplying thereby the sealing resin in a circumferential area of the semiconductor device mounted on the substrate; forming with the sealing resin a filet in the circumferential area, the filet being uniform in quantity of resin; and further comprising the step of arranging, on an inner side of the mounting pad on the substrate, the solder resist zones each of which has a trapezoidal-like contour, the trapezoidal-like contour including a lower edge on a central side of the mounting section and an upper edge on an outer side of the mounting section, the upper edge being longer than the lower edge, the upper and lower edges being parallel to an associated one of edges of the semiconductor device mounted on the substrate.

14. The semiconductor device mounting method in accordance with claim 13, wherein the solder resist zones has a thickness ranging from 10 μm to 30 μm .

17. A semiconductor device mounting method in which on a substrate on which a mounting pad including a mounting section is formed, sealing resin is supplied by one-point coating onto a central position of the mounting section, a semiconductor device including a plurality of projected electrodes is placed on the substrate, and the resin is heated under a predetermined

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pressure to thereby mount the semiconductor device onto the substrate, comprising the steps of:

arranging in the mounting section a plurality of solder resist zones to orient a flow of the sealing resin in a predetermined direction, the zones projecting upward;

mounting the semiconductor device on the mounting section and supplying thereby the sealing resin in a circumferential area of the semiconductor device mounted on the substrate;

forming with the sealing resin a filet in the circumferential area, the filet being uniform in quantity of resin; and further comprising the step of arranging, on an inner side of the mounting pad on the substrate, two solder resist zones each of which has a trapezoidal-like contour, the zones opposing each other, the trapezoidal-like contour including a lower edge on an outer side of the mounting section and an upper edge on a central side of the mounting section, the lower edge being longer than the upper edge, the upper and lower edges being parallel to a longer edge of the rectangular contour of the semiconductor device mounted on the substrate, the method further comprising the step of arranging, on an inner side of the mounting pad on the substrate, two solder resist zones 314 each of which has a contour, the zones opposing each other, the contour including a bottom edge on a peripheral side of the

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mounting section and a vertex opposing the bottom edge on a central side of the mounting section, the bottom edge being parallel to a shorter edge of the semiconductor device mounted on the substrate.

18. The semiconductor device mounting method in accordance with claim 17, wherein the solder resist zones has a thickness ranging from 10 μm to 30 μm .

To further clarify the teaching of a shorter edge of the semiconductor device, it is noted that the edge of the device is shorter than an edge of the substrate 310.

Although, as cited, Greenwood teaches a trapezoidal-like contour 314, and further teaches that "other shapes can be used for the islands 314," Greenwood does not appear to explicitly teach a trapezoidal contour. Notwithstanding, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose this particular shape because applicant has not disclosed that the shape is for a particular unobvious purpose, produces an unexpected result, or is otherwise critical, and it appears prima facie that the process would possess utility using another shape. In fact, in the instant specification, at page 12, lines 23-28, and page 13, lines 12-14, applicant emphasizes that the particular resist

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zone shape is not critical, and that it is indeed determined by design choice bounded by manufacturing constraints and ascertainable by routine experimentation and optimization. Moreover, it has been held that limitations directed to shape are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Similarly, although Greenwood teaches the trapezoidal-like contour including a lower edge on a central side of the mounting section and an upper edge on an outer side of the mounting section, the upper edge being longer than the lower edge, Greenwood does not appear to explicitly teach the trapezoidal-like contour including a lower edge on an outer side of the mounting section and an upper edge on a central side of the mounting section, the upper edge being longer than the lower edge. Again, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to

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choose this particular shape because applicant has not disclosed that the shape is for a particular unobvious purpose, produces an unexpected result, or is otherwise critical, and it appears prima facie that the process would possess utility using another shape. In fact, the only disclosure of this embodiment is the claim 13 recitation. Moreover, rearrangement of parts, and "simple adjustment of spatial orientation" was held to have been obvious. In re Japikse 86 USPQ 70 (CCPA 1950); Colt Industries Operating Corp. v. Index Werke, K.G. et al., 217 USPQ 1176 (DC DC 1982).

Greenwood also does not appear to explicitly teach that the sealing resin is supplied by one-point coating. Nevertheless, as applied supra, Tsukagoshi teaches this limitation. In addition, it would have been obvious to combine the invention of Tsukagoshi with the invention of Greenwood because it would supply the coating onto a central position.

Further, Greenwood does not appear to explicitly teach two solder resist zones each of which has a triangular contour. Still, as cited supra, Tsukagoshi teaches two solder resist zones 6 each of which has a triangular contour. Moreover, it would have been obvious to combine the invention of Tsukagoshi with the invention of Greenwood because it would provide solder resist zones.

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The prior art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to the group receptionist whose telephone number is 703-308-1782.

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is 703/305-3431.



David E. Graybill
Primary Examiner
Art Unit 2814

D.G.
9-Jan-02